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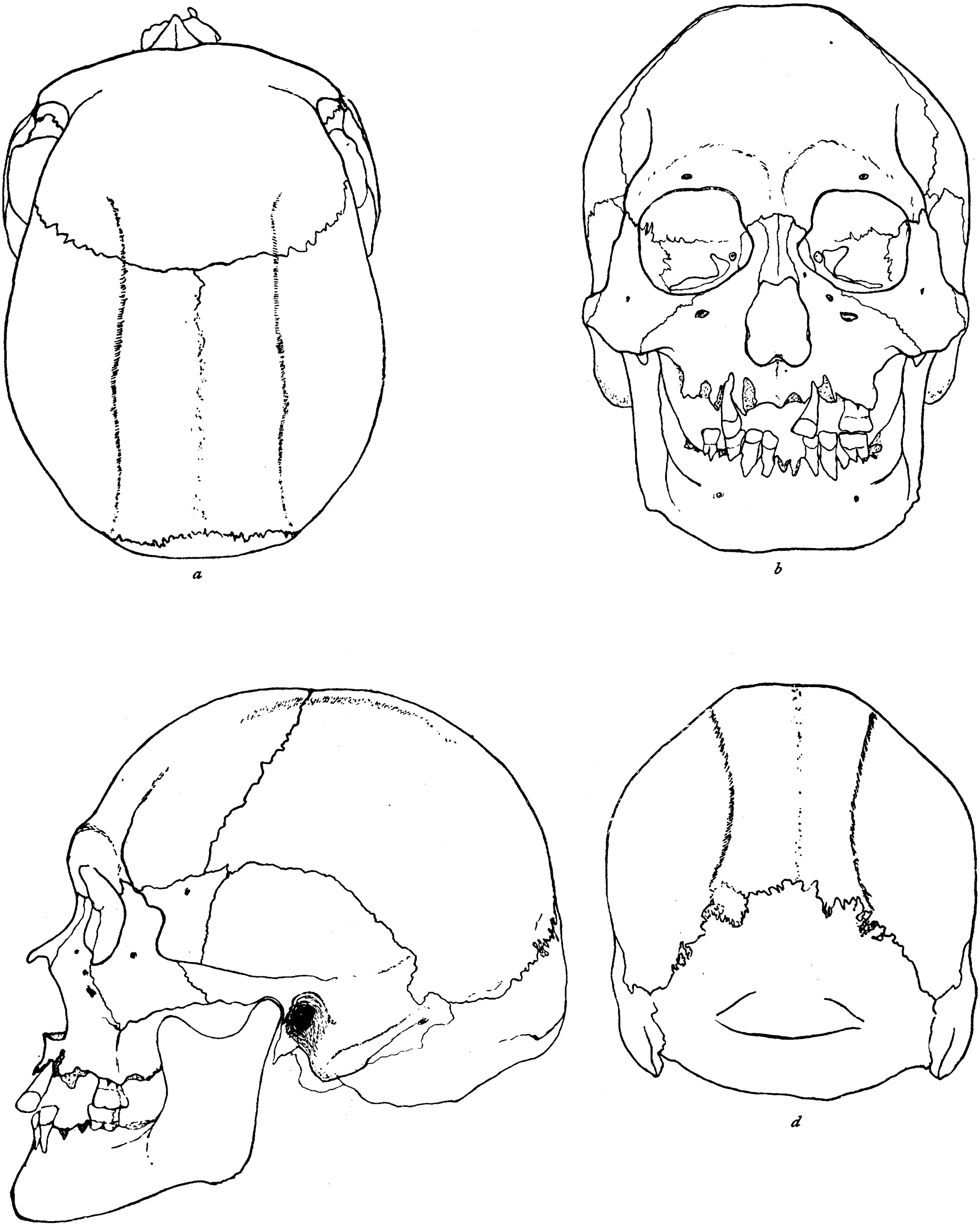

THE TALAYOTE SKULL

a, Anterior view ; *b*, Superior view ; *c*, Lateral view ; *d*, Posterior view. (A. M. N. H., No. 99–45.)

A PAINTED SKELETON FROM NORTHERN MEXICO, WITH NOTES ON BONE PAINTING AMONG THE AMERICAN ABORIGINES[1]

By ALEŠ HRDLIČKA

In 1899 I described an ancient skeleton from the valley of Mexico[2] which was particularly remarkable for its many inferior characters and anomalies. In my further examinations of the osteological material in the anthropological collections of the American Museum of Natural History, I came across another Mexican skeleton which exhibits a sufficient number of points of interest, partly of somatological and partly of ethnological character, to deserve special description.

This skeleton, as the one described before, was obtained by Dr Carl Lumholtz near Talayote, a rancheria in the most southerly part of the state of Chihuahua. It was found buried, with the head toward the west, about half a meter deep in the dark soil of a mesa near the above-named place. The region of Talayote lies in the Sierra Madre at over 7500 feet elevation; it has rather a dry climate, with a wet season of not long duration, and is and long has been occupied by the Tepehuane tribe of Indians. The field in which the skeleton was found, according to indigenes, has been used at times for a burial ground. Nothing of scientific interest was discovered immediately with the skeleton, and further search of the field could not be conducted owing to opposition on the part of the natives.

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[1] Published with the permission of the Trustees of the American Museum of Natural History, New York City.

[2] "Description of an Ancient Anomalous Skeleton from the Valley of Mexico; with Special Reference to Supernumerary and Bicipital Ribs in Man," *Bulletin* of the American Museum of Natural History, XII, art. V, pp. 81–107; also, translated by A. Herrera, in the *Anales* of the Museo Nacional, VII, p. 75 *et seq.*

The skeleton (No. 99-45 A. M. N. H.) consists of a complete skull and lower jaw, both clavicles, twelve (mostly incomplete) ribs, a portion of the right scapula, parts of six dorsal vertebræ and one complete lumbar vertebra, the sacrum, both coxal bones, the long-bones of the right arm and forearm and those of both lower extremities, the right calcaneum, one patella, two tarsal bones, and five metatarsals and phalanges from the feet.

All the bones are apparently very largely, if not entirely, devoid of animal matter, while the enamel of the teeth is chalky. Such a condition of bones and teeth would, if these were found in a sandy soil in a similarly dry region, indicate a very old burial; but as the skeleton was found in agricultural soil, in which decay of organic matter is more rapid, the burial in all probability is not very ancient. Still, a correct estimate in this matter, unless all local conditions are very well known, is impossible.

Almost all the bones of the skeleton show patches, in some instances (as in the tibiæ and femora) very extensive, of superficial effects of burning, but in no place are the bones charred. It is very probable that the burning had been employed for the purpose of destroying the soft parts, or their remainders, adhering to the bones.

The deficiencies of the dorsal vertebræ are of peculiar character, which fact is probably also of some ethnological significance. Each one of the bones is divided through the pedicles, and the bodies are all absent. The breaks correspond fairly well in place and character, and suggest an artificial opening of the spinal canal. It is possible that these breaks are in connection with an artificial enlargement of the foramen magnum in the skull, and that their purpose was the extraction from its cavities of the nervous matter.

In addition to those mentioned, most of the bones of the skeleton, and particularly the ribs and vertebræ, show red coloring, both externally and in their interstices. The skull shows numerous patches of the coloring, particularly on the facial parts; it is free from it on its ventral or endocranial surface and in a large portion of the nasal cavity. Of the long bones of the lower limbs distinct remnants of staining are found only on the right femur, but the pigment is very plain on the bones of the tarsus.

The coloring is due, as I ascertained with the aid of Dr Bookman, Associate in Chemistry in the Pathological Institute of the New York State Hospitals, to an amorphous pigment of organic nature, allied in color to cochineal, and entirely insoluble in water. It is plain that the staining is not accidental. The pigment was either applied to the surface of the bones as paint and subsequently penetrated into their various crevices, or was buried with the bones and subsequently spread over and into them. Judging from the aspect of the surface of the bones, particularly that of the scapula and vertebræ as well as parts of the skull, the former of these views is the much more probable.

The femora and tibiæ show signs of scraping, but the scraped surfaces look rather fresh. Closely adhering to the internal surface of the left tibia is a piece of fabric, similar in appearance to the coarse, brown, sack-like cloth, remnants of which are not infrequently found with skeletons in northern Mexico. Apparently the bones had been wrapped in such a fabric.

The absence of the whole left arm and the left scapula is peculiar.

Description of the Skeleton

The bones under consideration are those of a male in somewhat advanced adult life. Calculating from Manouvrier's tables, on the basis of the long bones, the man was about 1.64 m. in height. None of the parts of the skeleton shows any disease or deformation; the right femur, however, presents traces of an ancient, well-repaired fracture of its shaft.

The skull is very small; its capacity, measured by Flower's method, amounts to only 1300 c.c., which, if we follow Flower's classification, ranges it among microcephalic crania (microcephals below 1350 c.c.). The only smaller Mexican male skull I have thus far seen was the San Simon specimen described in the publication previously mentioned; this particular cranium measured, by Flower's method, only 1225 c.c. The Talayote skull is further remarkable by reason of its highly situated and very prominent temporal crests, which give the calvarium a marked pentagonal form.

DETAILED NOTES

The *supraorbital ridges* are very pronounced and prolonged from the glabella to the malo-frontal articulation. The glabella itself is somewhat less prominent, and as a result of this the ridges are separated by quite a marked median depression.

The *forehead* of the skull is narrow and sloping, and the whole frontal bone is of extraordinarily small proportions, as will be seen from the following measurements:

Diameter frontal minimum.......8.6 cm.
Diameter frontal maximum......11.0 cm.
Arc of nasion-bregma...........12.3 cm., of which the nasion-ophryon is 2.5 cm.

Where there is not much lateral bulging of the frontal bone, the degree of the sloping of the forehead is indicated quite well by the difference between the length of the two arcs passing from the auditory meati over the forehead—one at its middle and one over the most prominent part of the frontal eminences. The difference between these two arcs varies among the Mexican Indians from 1.0 to 1.8 cm. in favor of the latter. Only very seldom is the difference smaller than 1 cm. In this case it is 0.5 cm. only.

Immediately above the very small frontal eminences the forehead rises on each side of the median line to a prominent dull elevation. These elevations or crests are located immediately above and run along the impressions of the temporal muscles and fascia. They run nearly parallel, about 4.0 cm. distant, and inclose a slight depression in their middle; they are continuous from the middle of the forehead to beyond the vertex, becoming gradually lower and less distinct, until at the level of the obelion they disappear. These crests give the frontal bone a pentangular shape, with the base of the figure reposing on the orbits. The formation is one of a very primitive order, and in an equally pronounced form is exceedingly rare among American crania. The only other specimen of this nature that came under my observation is a microcephalic skull from a mound on Detroit river, Michigan. This specimen is preserved in the Peabody Museum, Cambridge, and was briefly reported in 1873[1] by Jeffries Wyman, who considered the crests in that skull (and I am of similar opinion in regard to the specimen that is being described) as of an inferior character, due to "an extreme case of individual variation from the ordinary form."

The *temporal regions* are quite flat and narrow; the biauricular diameter (vertically above the external meati and above the roots of the zygomæ) is 12.2 cm. The *parietal bosses* are rather prominent (diameter between their centers, 12.8 cm.).

Occipital region.—The space over the lambda is flat. The inion region and the neighboring parts of the bone beneath the highest curved line are bulging and rough. The superior curved line of the occipital squama is quite plain, but there is no well-formed occipital crest. Below the inion region the bone is flat for about 3.0 cm., and then presents a marked bilateral, cerebellar bulging separated by a median digital depression.

The *mastoids* are of medium masculine size, and are bounded on each side above and dorsally by a marked zygomatic ridge.

The *base of the skull* shows a decidedly inferior development. The middle lacerated foramina are small; the petrous portions of the temporal bone are on a level with the surrounding parts; the styloids are diminutive.[2]

The spinous process is double on each side, the second part rising from the petrous portion. The vaginal processes are unusually high and apparently compensate for the defect of the styloids. The glenoid fossa is of but moderate depth.

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[1] *Sixth Annual Report* of the Peabody Museum, pp. 12, 13.

[2] On the significance of these characters see *Science*, Feb. 22, 1901, p. 309.

The opening of the *foramen magnum* is enlarged on the left side, the border and some neighboring parts of the bone being broken off.

The *cranial sutures* are very simple. Obliteration is quite advanced, involving the whole sagittal suture, and spots in both the lambdoid and the coronal sutures. (The nasal sutures are patent except the lower end of the internasal.)

The *pterions* form both a narrow H (1.0 cm.).

There are but two small *intercalated bones* in the cranial sutures, one in the left portion of the lambdoid and the other in the right spheno-parietal suture. (In addition there is a moderately large irregular Wormian bone in the right spheno-malar suture.)

The parietal foramina, one on each side, are of ordinary size.

The *facial parts* are of moderate prominence. The face as a whole is relatively narrow.

The outline of the *orbits* is very irregular; the orbital edges are of medium dullness. The supraorbital wall encloses on each side a supraorbital foramen; these foramina are situated farther outward than usual (the right 3.1 cm., the left 3.0 cm. from the center of the glabella).

The *nasion depression* is of moderate depth; the nasal bridge is somewhat low and narrow, concave in its upper third and straight in the remainder. The nasal aperture is rather narrow; the nasal spine is of medium strength and height, though quite short. The nasal border is sharp. There is on each side a moderate subnasal fossa.

The *malars* are of medium strength and prominence. Across the middle of each bone runs a marked antero-posterior ridge. The marginal processes are very pronounced. The zygomæ are broad and strong.

The suborbital (" canine ") fossa is shallow on the left, moderately deep on the right side. There is a smaller supplementary infraorbital foramen on the left, and on each side can be seen a suture passing from the infraorbital foramen to the orbital border.

The upper dental arch is somewhat irregular, due to old losses of teeth; and rather low, due to advancing absorption. Due to this absorption alveolar prognathism, apparently pronounced before, has become less noticeable. The lower alveolar arch is in every respect normal.

Teeth.—The dentition has been complete (thirty-two). A number of the teeth were lost during life, and two of those remaining show signs of decay. The teeth are of medium size and of normal form ; length of right upper canine, 2.6 cm. The upper front teeth were apparently somewhat irregularly set, and the roots of the middle incisors were short. The enamel of the teeth, as above mentioned, is chalky. The crowns of the molars show moderate wear.

The *palate* is ovoid in shape, quite shallow, broad posteriorly and short. Length (alveolar point to line connecting the posterior ends of the alveolar arch), 4.9 cm.; breadth maximum externally, immediately above the molars, 6.6 cm.; palatal index, = 134.7 hyper-brachyuranic. Height opposite first molars, 1.0 cm.

The *posterior nares* are broadest inferiorly, near the palate; the openings measure each 3.0 cm. in maximum height (to the sphenoidal border) and 3.0 cm. in maximum breadth (together).

The *lower jaw* is of medium strength and normal form. The chin is quite protruding; the angle between the plane of the horizontal rami and the line from the protuberance of the chin to the median point of the lower alveolar process, is about 60°. Angles between the horizontal and vertical rami, 116°. The angles are but moderately developed. The coronoid and condyloid processes are of nearly equal height.

Measurements:

Diameter bigonial	9.8	cm.
Length of horizontal ramus (mean)	9.6	“
Height of vertical ramus	6.0	“
Breadth of vertical ramus at middle	3.3	“
Anterior height of the jaw (less the teeth)	3.2	“
Depth of sigmoid notch (mean)	1.15	“
Thickness opposite second molar	1.85	“

The facial and palatine sutures present nothing unusual.

CRANIAL MEASUREMENTS

The breadth-length index of the cranium is **72.8**, the diameter antero-posterior being 18.0 cm. and the diameter lateral maximum 13.1 cm. This index places this skull in the great group of dolichocephals of upper Mexico, and is near that of four other Tepehuane as well as that of the Tarahumare crania in the American Museum collection.

The height of the skull (basion-bregma) is 13.2 cm., which gives the height-length index of **73.3**, and the height-breadth index of **100.8**. The skull is metriocephalic (Turner) and in that respect is also similar to other north Mexican dolichocephalic crania.

The *face*, as mentioned before, is relatively high and narrow. The menton-ophryon diameter measures 14.3 cm., the alveolar-point-nasion diameter about 7.1 cm., the maximum bizygomatic diameter 13.0 cm.; this gives the low general facial index of **91.5**, and the upper facial index (Kollman) of **54.6**.

The external orbital diameter is 10.2 cm., the bijugal diameter 11.7 cm.

The face as a whole is orthognathous; basion-nasion diameter 9.7 cm., basion-alveon diameter about 9.1 cm., gnathic index (Flower) about **94**. The index of alveolar prognathism is about **114**, which is not excessive for an Indian cranium.

The *orbits*, in the mean, are 4.2 cm. deep, 3.8 cm. broad, and 3.6 cm. high. Their index, **94.7**, considering the pronounced supraorbital ridges, is very high. The mean orbital index of three other male Tepehuane crania in the Museum ranges from 87.5 to 94.1. The interorbital distance is 2.4 cm.

The *nose* is leptorrhinic; height 5.3 cm., maximum breadth of aperture 2.4 cm., nasal index **45.3**. In four other male Tepehuane crania this index ranges from 45.3 to 56.2.

Additional measurements:

Rays:	Basion-menton	10.6 cm.
	Basion-ophryon	11.2 "
	Basion-bregma	13.2 "
	Basion-maximum	13.6 "
	Basion-lambda	10.7 "
	Basion-inion	8.8 "
Arcs:	Middle of external meati, over middle of forehead,	29.0 cm.
	Middle of external meati, over frontal eminences	29.5 "
	Middle of external meati, over bregma	30.8 "
	Middle of external meati, over maximum	32.3 "
	Middle of external meati, over lambda	28.6 "
	Middle of external meati, over inion	25.9 "
	Nasion-bregma	12.3 (34.2 %)
	Bregma-lambda	12.3 (34.2 %)
	Lambda-opisthion	11.4 (31.7 %)
	Circumference maximum (above ridges)	50.0 cm.

VERTEBRAL COLUMN

Portions of six dorsal and one complete lumbar vertebræ are present. The size of all these bones is moderate and the form ordinary.

Measurements of the lumbar vertebra:

Antero-posterior diameter of the whole bone	7.15 cm.
Lateral maximum diameter of the whole bone	9.5 "
Breadth maximum of the spinal canal	2.7 "
Antero-posterior diameter of the spinal canal	1.5 "
Height of the body of the vertebra, anteriorly	2.65 "
Height of the body of the vertebra, posteriorly	2.00 "

The body is somewhat higher on the right than on the left side.

SCAPULA

The portion of the right scapula shows that the whole bone was rather submedium in strength and size. The suprascapular notch is shallow.

CLAVICLES. RIBS

Both the clavicles and the ribs are of moderate strength; form normal. All the bones are damaged.

UPPER EXTREMITY

There are present, as hitherto remarked, only the bones of the right arm and forearm. All these are of moderate strength and of quite ordinary form. The olecranon fossa of the humerus is not perforated and there is no trace of the supracondyloid process.

The measurements are:

Humerus:	Length maximum	30.5	cm.
	Diameter antero-posterior at middle	2.35	"
	Diameter lateral at middle	1.7	"
	Shape of shaft 6 (plano-convex [1]).		
Radius:	Length maximum	24.2	cm.
	Shape of shaft 3 (anterior surface concave).		
Ulna:	Length maximum	26.0	cm.
	Shape of shaft 1–3 (intermediate).		

Humero-radial index 79.3, which is between Turner's mesatikerkik and dolichokerkik divisions. In whites this index is generally below 75; in African negroes between 75 and 79; in North American Indians, males, between 75.8 and 79.9, in the mean (Wyman, Davis, Russell, and Huxley).

LOWER EXTREMITIES

All the long bones present; all medium strong and normal conformation. The right femur shows signs of an ancient, very oblique, well-repaired fracture above the middle of the shaft. The measurements are:

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[1] See "Typical Forms of Shaft of Long Bones," *Proceedings* Assoc. Amer. Anat., 14th session, 1900, pp. 55–60.

Femora :	Length, left, oblique, 42.7 cm., maximum	42.9 cm.
	Right, oblique (39.4 cm.), maximum	(39.8 “)
	Diameter antero-posterior at middle	2.9 cm.
	Diameter lateral at middle	2.4 “
	Diameter antero-posterior at upper flattening	2.2 “
	Diameter lateral maximum at upper flattening	3.2 “
	Index at upper flattening	**68.7**
	Shape of shaft, left, 1–r (intermediate).	

Linea aspera moderate ; no third trochanter ; neck short, angle medium.

Tibiæ :	Length, minus spine, right	35.8 cm.
	Length, minus spine, left	35.7 “
	Diameter antero-posterior at middle, right, 3.1 cm., at nutritive foramen	3.45 “
	Diameter antero-posterior at middle, left, 3.1 cm., at nutritive foramen	3.5 “
	Diameter lateral at middle, right, 2.3 cm., at nutritive foramen	2.4 “
	Diameter lateral at middle, left, 2.3 cm., at nutritive foramen	2.5 “
	Index of right at middle **74.2**, at nutritive foramen	**69.6**
	Index of right at middle **74.2**, at nutritive foramen	**71.4**

Inclination of head moderate. Height of maleolus, both sides, 0.8 cm. The indexes of the tibia are somewhat higher than the average in North American Indians. Shape of the shaft of the tibiæ: right 1–4 (intermediate), left near 1 (nearly prismatic).

Fibulæ :	Length maximum left 34.4 cm.	right damaged.
	Shape of shaft, in both 2	(lateral prismatic).

Tibio-Femoral Index :	Oblique length of femur	**83.6**
	Maximum length of femur	**83.2**
	Oblique length of femur and tibia less spine and maleolus (Turner)	**82.2**

The tibia is nearly dolichoknemic (Turner) and agrees well in relative length with the tibiæ of North American Indians in general.

The intermembral index can be calculated only from the lengths of the left lower and right upper extremities. Taking the maximum length of the arm-bones, the oblique length of the femur, and the maximum minus-the-spine length of the tibia (more accurate, even if otherwise less satisfactory length, than the one minus spine and maleolus), the intermembral index is **69.8**, which also agrees well with that in other North American aborigines and is but slightly higher than that in Europeans (Europeans, mean, about 69.5, anthropoids 103.5 to 141, Turner).

The femoro-humeral index (oblique length of the femur), which amounts on the average to about 72.5 in whites (Turner), and ranges from 97.7 to 133.4 in apes, is in this skeleton **71.4**.

PELVIC BONES AND PELVIS

The *sacrum* shows moderate dimensions and a moderate, nearly uniform, curvature. It measures 10.8 cm. in height and 10.9 cm. in maximum breadth, which gives the sacral index of **100.9**. The same index is about 112 in male Europeans, 106 in the Negro, 99 in the Australian, and from 89 to 72 in anthropoids (Turner).

The *Ossa innominata* are of medium strength and are rather small; the iliac fossæ are not translucent as is usual in Europeans.

Height maximum, mean	19.3 cm.
Distance from anterior to posterior superior spine	14.0 "
Index of ossa innominata	**72.5**

The pelvis as a whole is not large nor massive, and is distinctly masculine (subpubic angle 55°).

Measurements:

Breadth maximum between the external iliac crests	24.7 cm.
General pelvic index $\left(\frac{\text{breadth of pelvis} \times 100}{\text{mean height of ossa innominata}}\right)$	**128.0**[1]

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[1] According to the method followed by Turner $\left(\frac{\text{mean height of ossa innominata} \times 100}{\text{breadth of pelvis}}\right)$ it is 78.1.

Diameter antero-posterior of the superior strait	10.7 cm.
Diameter lateral maximum of the superior strait	11.4 "
Index of the superior strait or pelvic inlet	93.9

The general pelvic index averages about 127 in male Europeans, 121 in male African Negroes, and 106 in anthropoids (Topinard). The superior strait index is generally below 90 (platypellic) in whites, from 90 to 95 (mesatipellic) in Negroes, and from 126 to 151 (hyper-dolichopellic) in anthropoids (Turner). The Talayote pelvis is mesatipellic, or somewhat rounder, at the superior strait, than the pelvis of a European.

Other measurements:

Diameter between the points of the ischiatic spines	8.3 cm.
Lower extremity of sacrum to lower edge of pubic symphysis	8.1 "
Pubis to tip of first spinous process on the sacrum, externally	16.5 "

PATELLA

Left:	Height	4.0 cm.
	Breadth	4.0 "
	Maximum thickness	1.8 "

OS CALCIS

Right:	Length	7.4 cm.
	Height of body (middle)	3.85 "
	Breadth of body (minimum at middle)	2.65 "

Peroneal spine absent; astragalus facet single.

RÉSUMÉ

The subject examined presents, as the main peculiarity, a small and otherwise inferior Indian cranium. The exceptional characters of the skull are apparently not racial features, but individual modifications. The rest of the skeleton is not in accord with the skull; although not without some special points of interest, it is, so far as can be judged from the rather scant data available for comparison, a fairly ordinary Indian skeleton. In this respect it differs considerably from the previously described skeleton from the valley of Mexico.

The painting of the bones requires special notice.

NOTES ON PAINTING OF HUMAN BONES IN AMERICA

The subject of bone-staining and bone-painting has been brought repeatedly to my attention during the last few years while engaged in examining the osseous remains of various Indians. So far as I have had occasion to observe, there are five distinct varieties of pigmentation of the bones.

The first variety, which is quite common, includes the skeletons that have been more or less stained or infiltrated accidentally by the coloring matter of the earth in which they have lain. As pronounced examples of this variety of staining I may mention the bones of a part of Mr Bandelier's collection from Bolivia (A. M. N. H.), which are thoroughly stained and infiltrated by red clay. This accidental staining is mostly reddish or yellowish, but it may be dark, as was observed by Professor Putnam in certain burial places in Tennessee, and as can also be seen in a number of Florida skulls in the American Museum. Usually in these cases all the bones of the body are colored, and with little difference in intensity.

The second variety of stained bones consists generally of skulls which had been stained green by salts of copper. These salts resulted mostly from the decomposition of copper ornaments or implements buried with the bodies. The staining in these cases, as a rule, is but partial; the coloring is greenish and is deepest at the points of contact with the decomposed articles.

In the third and probably the most frequent and widely distributed variety of stained bones, there is more or less staining of the skeleton by pigments which were buried with the body. In most cases known to me, or of which I have found mention in literature, the coloration was red, and in most instances due to red ocher. In a few cases, probably more recent burials, the pigment was vermilion.

The fourth class of stained bones seems to be much more restricted than any of the preceding; it consists mainly of skulls which had been painted by hand. In all but one case known to me the paint was red, and was applied sometimes over the facial parts of the skull only, at other times over the whole cranium, and in a few instances also over other bones of the skeleton. I am enabled to cite examples of this class from United States, Canada, and other regions.

The fifth and final variety of bone-staining consists of skulls on which designs have been made in colors. Such specimens thus far found are few and they are probably all recent.

It is principally the last three varieties of pigmented bones which are, each in a distinctive way, of ethnological interest, for they represent so many different, though probably related, customs of the American aborigines.

The geographical distribution of stained or painted bones on this continent appears to be very wide, but so far is quite irregular. With the increase of material, some of the existing lacunæ will undoubtedly be filled, while in other cases there will be traced, according to indications, allied customs. On the whole it seems that one or another use of red pigment, particularly ocher, has been quite general in the funerary rites of the American Indians.

The deposit of pigments, particularly of ocher, in the shape of paint, with the bodies of warriors, and especially of chiefs, seems to have been very prevalent, if not general, among the North American Indians from remote times. Red paint was one of the Indian's necessities, and, with some of his other possessions, was buried with him as a part of his equipment for the future world or his journey thither. Lafitau (II, 8, p. 413), in referring to the articles generally interred with the body of an Indian, mentions, among other things, "a quantity of oil and some color with which to paint himself." Loskiel (II, p. 120) tells us that the Indians formerly "used to put a tobacco-pouch, knife, tinder-box, tobacco and pipe, bow and arrows (or a gun, powder and shot), skins and cloth for clothes, *paint*, a small bag of Indian corn or dried bilberries, sometimes the kettle, hatchet, and other furniture of the deceased, into the grave, supposing that the departed spirits would have the same wants and occupations in the land of souls as they had in this world. But this custom," Loskiel says, "is now [in 1794] almost entirely abolished in the country of the Delawares and Iroquois."

Among the Hurons, according to Sagard (*Histoire du Canada*, Paris, 1636, III, p. 647), some paint was buried with the women, in order that they could paint their robes. Quantities of red ocher have been found in ancient Maine graves by Mr C. C. Willoughby, of the Peabody Museum. Rev. J. M. Spainhour, in 1871, found in a mound on St John's river, North Carolina, three skeletons, and with each a quantity of red pigment (Yarrow, p. 27). According to Elliott (I, 60) and Young (p. 142), "the first Europeans who came to Cape Cod found there in an Indian grave nice matting, a bow, a decorated and painted board, and two bundles of red powder, in which lay the bones of the buried."

Mr Moorehead found red ocher, and in a few instances also yellow and white mineral paints, heaped, as he expresses it, on or near the hands or other parts of the body, in earth mounds in several parts of Ohio. Lewis and Clark (I, p. 239) mention having found some red and blue paint with the cadaver of an Assiniboin female. Mr H. I. Smith, of the American Museum of Natural History, unearthed a skeleton at Saginaw, Michigan, which was covered with red pigment, the surrounding soil being of a totally different character. Dr J. Walter Fewkes found vessels containing "yellow ocher, sesquioxide of iron, green copper carbonate, and micaceous hematite" in what was apparently the burial of a priest, at Awatobi, a ruin at the base of what was formerly the first mesa of the Hopi Indians, in northern Arizona; and he found similar pigments in graves at Sikyatki, another ruin in the same region. Examples of a similar nature could be multiplied.

In a number of instances it is difficult, if not impossible, to decide whether the given bones have been stained accidentally by the pigment buried with the body, or whether they have been intentionally painted.

Judging from the references to Indian mortuary customs, made by various authors, there were apparently a large number of instances in which in addition to, or possibly without, the deposit of some pigment with the deceased, the body, or at least the face, was painted. If the pigment used was mineral in character, as was almost invariably the case, the probability of the bones becoming stained by it after the flesh had decayed cannot be excluded. The custom of painting the body is especially well described by Lafitau. Speaking of the Indians of New France, he says that among them every "cabane" had special individuals who took care of the deceased. Those who are thus employed "wash the body, oil it, and paint its face and head. . . . Sometimes the man while yet living announces his death, arranges a feast, and lets himself be washed, oiled, and painted, and bundled up still alive into the position which he is to have in the grave."

Loskiel gives similar information about the Indians of the eastern states and Canada: "Immediately after the death the corpse is dressed in a new suit, with the face and shirt painted red, and laid upon a mat or skin in the middle of the hut or cottage." Charlevoix (VI, p. 107) says that among the Canadian Indians "the dead man is painted, enveloped in his best robe, and, with his weapon beside him, is exposed at the door of his cabin in the posture which he is to preserve in the grave." Sagard (III, p. 649), speaking also of more than one northeastern tribe and without mentioning any separately, says that "not only are the savages in the habit of painting their faces black when any of their relatives dies, but they paint also the face of the cadaver."

The Iroquois, according to La Potherie (III, p. 9 et seq.), "visit from time to time the burial place, paint the half-rotten bodies, change their clothing and rearrange them in the fossa." Morgan also mentions the face-painting of the dead Iroquois.

All the nations of the upper Missouri, according to Perrin du Lac, painted the bodies of their dead warriors with red ocher. These tribes comprised the Ricaras, Mandans, Gros-ventres, Chugayennes, Sioux, Cayoroas, Tocaninambiches, Tokionakos, Pitapahatos, Padaws, Halisanes, Assiniboins, and Crows. The custom was witnessed among the Crows as late as 1870 by Col. P. W. Norris, Superintendent of the Yellowstone Park (cited by Yarrow); and quite as late among the Dakotas by Surgeon L. S. Turner, U. S. A. (also cited by Yarrow). "The work among the Dakotas," says Dr Turner, "begins as soon as life is extinct. The face, neck, and hands are thick-painted with vermilion or a species of red earth found in various portions of the Territory."

The Creeks practised a similar custom[1] and there are indications of the former existence of a similar habit among the Omaha.

Professor Boas informs me that many of the tribes of the North and Northwest paint the faces of their dead; he has observed the use of other colors than red, though the latter predominates.

As to the Southwest and Mexico, information on this subject is very meager, but evidence points to similar practices.

Bone-painting proper is comparatively rare, or at least much less common than the custom of paint interment and of the painting of various parts of the corpse. We meet with instances of bone-painting proper in Ohio, Florida, and South Carolina, in the East; in California, and possibly in British Columbia, in the West and Northwest; in Mexico, and in a few parts of Central America and South America.

In Ohio painted bones were found by Prof. F. W. Putnam

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[1] Schoolcraft, V, p. 270.

(Turner group mounds) and by Mr W. K. Moorehead. The latter writes[1] me on the subject as follows:

> "Painted bones have been found in a mound at Omega, Ross county, Ohio; in Jackson county mound, Ohio, and in two mounds within the corporate limits of Chillicothe. One of the latter was discovered by Mr Clarence Loveberry, assistant curator of the above [Ohio Archeological and Historical] Society. The others were found by myself. Near Green Camp, Marion county, Ohio, in a stone grave six feet below the surface, Mr Loveberry discovered a skeleton entirely painted.
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> "All of these were coated with red pigment or ocher, and in nearly every case all of the larger bones. There are other instances in which just the hands, or the feet, or perhaps the skull were coated. These are usually from mounds, either large or small. Bones on which the pigment was simply heaped, were clearly distinguished by the surrounding soil being also stained.
>
> "I have never observed instances in which skeletons were coated with yellow or black paints. (We have found yellow and white mineral paints near the hands of skeletons several times.)
>
> "We have never found painted bones in stone mounds. They are invariably in earth mounds or stone graves."

In South Carolina the custom is thus described by Lawson (pp. 21, 22):

> "As soon as the party is dead, they lay the corpse upon a piece of bark in the sun, seasoning or embalming it with a small root beaten to powder, which looks as red as vermilion[2]; the same is mixed with bear's oil to beautify the hair and preserve their heads from being lousy, it growing plentifully in these parts of America. After the carcass has laid a day or two in the sun, they remove and lay it upon crotches cut on purpose for the support thereof from the earth, then they anoint it all over with the fore-mentioned ingredients of the powder of this root, and bear's oil. When it is so done, they cover it very exactly over with bark of the pine or cypress tree, to prevent any rain to fall upon it, sweeping the ground very clean all about it.
>
> "As soon as the flesh grows mellow, and will cleave from the bone, they get it off and burn it, making all the bones very clean, then anoint them with the ingredients aforesaid, wrapping up the skull (very carefully) in a cloth artificially woven with possum's hair. . . . The bones

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[1] Letter dated Sept. 21st, 1897.

[2] Sanguinaria?

they carefully preserve in a wooden box, every year oiling and cleansing them; by these means preserve them for many ages, that you may see an Indian in possession of the bones of his grandfather, or some of his relations of a longer antiquity."

In Florida bone-painting seems to have been practised extensively and from an early period. The custom is mentioned in this part of the country by Garcilasso de la Vega and by Herrera. Romans (p. 88) describes it among the Choctaw as follows:

> "The day [of the burial] being come, the friends and relations assemble near the stage, a fire is made, and the respectable operator, after the body is taken down [from the stage on which it has lain for two to four months], with his nails tears the remaining flesh off the bones and throws it with the entrails into the fire, where it is consumed; then he scrapes the bones and burns the scrapings likewise; the head being painted red with vermilion is with the rest of the bones put into a neatly made chest (which for a chief is also made red) and deposited in the loft of a hut built for that purpose, and called bone-house; each town has one of these; after remaining here one year or thereabouts, if he be a man of any note, they take the chest down, and in an assembly of relations and friends they weep once more over him, refresh the color of the head, paint the box, and then deposit him to lasting oblivion.
>
> "An enemy and one who commits suicide is buried under the earth as one to be directly forgotten and unworthy of the above ceremonial obsequies and mourning."

The late Andrew E. Douglass found painted bones near St Augustine, Florida.[1]

In California, the custom of bone-painting seems to have been practised very extensively. I handled some apparently painted California skulls in the National Museum at Washington. Dr H. F. ten Kate discovered several painted skeletons in southern California (a cave on Espiritu Santo island) and M. Diguet found others in the valley of Las Calaveritas. All the specimens from this part of the country were painted red; those discovered by ten Kate and those which I saw were colored with ocher, while Diguet's specimens were decorated with a paint obtained from volcanic ashes. According to M. Diguet (p. 43), the localization of the burials in which painted bones are found is restricted to "the islands of Espiritu Santo and Cerralbo, and a number of localities on the peninsula reaching in a straight line from the Gulf of California to the Pacific ocean."

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[1] Sanchez Mound, situated about 8 miles north of St Augustine. Over 20 bodies found. "Each cluster of bones was surmounted by the skull, and the whole mass encrusted with red paint, which discolored the sand an inch around them" (*Proceedings* Am. Assoc. Adv. Sci., 1882, XXXI, p. 587).

Professor Boas informs me that some red skeletons have been excavated near Thompson river in British Columbia, but it is not certain whether these bones were accidentally stained or intentionally painted. In the collection of the American Museum of Natural History is a skull (No. 99–1604), of a Clayoquot warrior from the west coast of Vancouver island, that is painted outwardly a very dark brown. There are other skulls from the Northwest in the collection that show red stains (particularly No. 99–3047, Copalis, west coast of Washington; Smith), but in these intentional painting is doubtful.

In Mexico, I have never found any color stain on the bones of the Tarahumare; however, the Tepehuane region, whence came the painted Talayote skeleton described in this paper, adjoins on the south that of the Tarahumare.

Several of the Tarasco crania from Michoacan (No. 99–175, for example) in the Museum collection show red stains, but these may be accidental.

Finally, the Museum collection includes several skulls and some bones of ancient Zapotecs and Mixtecs, collected by Mr Saville in Oaxaca, and some of these show plain and indubitable signs of red painting.

As to Central America and South America, one of the two references to the custom which I have noted concerns the Caribs, who, according to Brinton's *Myths of the New World* (p. 225, after Gumilla), about a year after death cleaned the bones of their dead, bleached them, painted them, and wrapped them in odorous balsams; they were then placed in a wicker basket which was kept suspended from the door of the dwelling. "When the quantity of these heirlooms became burdensome, they were removed to some inaccessible cavern and stored away with reverential care."

The second instance pertains to the Bororos, one of the Amazon tribes, who, according to Ehrenreich, bury the body about two weeks after death, decorating the head with small red feathers and painting the bones red.

I have thus far found no historical evidence of bone-painting in Peru. Among more than five hundred ancient Peruvian crania in the American Museum there is but one that shows distinct red stains, but these seem to be more accidental than otherwise.[1]

The painting of designs on human skulls requires but few words. I have seen but three specimens of this sort, and found no mention of others. One of these skulls came from California and is preserved in the National Museum at Washington; the other was found by Mr H. I. Smith at Lytton, British Columbia, and is in the American Museum of Natural History, New York. The design on both these skulls consists of a red cross. It was made, in all probability, quite recently by some christianized Indians. The third, which I came across recently, is a skull decorated with brown streaks and made into a stringed musical instrument. The specimen is preserved in the Metropolitan Museum of Art, New York, and is supposed to be of South American Indian origin. Thus far the Museum has no further information.[2]

Beyond this continent painted bones were found especially in Crimea (Vasselovski), and in many parts of southwestern Russia (Antonowitch, Zaborovski, etc); but they are not restricted to Europe. Skulls with painted designs, of quite recent origin, were found in Tyrol and are now preserved in the Zuckerkandel collection in Vienna.

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[1] Since this was written, the American Museum of Natural History has received the Gaffron collection of skulls from Peru, and one among these (that of a male), from the neighborhood of Cuzco (No. 99–3682), shows over large portions of its surface a pink incrustation, in all probability the remnant of intentionally applied paint.

[2] There is a possibility that this skull is from Africa.

THE SIGNIFICANCE OF BONE-PAINTING

Bone-painting among the American aborigines seems most probably to be a development of the custom of painting the corpse, just as the latter is an extension of the custom of painting the living. Paint, particularly red paint, was, and to some extent still is, among many American Indians, a part of the warrior's preparation for battle, and it was a mark of fitness, elevation, bravery, honor; and some of the tribes honored their distinguished dead, or even all their dead, with paint applied for a similar object and in more or less the same manner in which it was used by the living. The bones of deceased friends were regarded with reverence. According to Brinton (op. cit., p. 257), the opinion underlying all customs connected with the preservation of bones among various American people was "that a part of the soul, or one of the souls, dwelt in the bones; that these were the seeds which, planted in the earth, or preserved unbroken in safe places, would, in time, put on once again a garb of flesh, and germinate into living human beings. Language illustrates this not unusual theory. The Iroquois word for bone is *esken*, for soul, *atisken*, literally that which is within the bone (Bruyas, *Rad. Verborum Iroquœorum*). In an Athapascan dialect bone is *yani*, soul *i-yune* (Buschmann, *Athap. Sprachstamm*, pp. 182, 188)."

Yet there may have been instances in which the flesh or the bones of the dead were partly or wholly painted for other reasons. It is probable that in some instances the paint was considered a necessary equipment for the journey to the future world. Lafitau (II, 8, p. 388) says that the Indians "applied the paint to the head and face in order that the horrors of death should not be seen." According to Professor Boas, among the Chinook, who bury their dead mostly in canoes raised above the ground, after a time "the burial place is made good with red paint," which implies that in this tribe such paint is connected with some superstition. Finally, according to Bandelier, among the Muysca in Bogota, New Granada, bodies painted with red ocher were a sign of deep mourning. The Navaho use red paint largely as a protection against sun and wind, and it is not impossible that among some tribes paint may have been applied to the dead as a preservative.

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